DOCUMENT RESUME

ED 254 135 HE 018 044

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TITLE Open Higher Education: The Management Challenge.
PUB DATE Aug 84
NOTE 43p.; Paper presented at the Asian Conference on Education (Bangkok, Thailand, August 12-18, 1984).
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrators; *College Administration; College Planning; Computer Oriented Programs; Decision Making; Delivery Systems; *Educational Change; Futures (of Society); Higher Education; *Lifelong Learning; Management Information Systems; *Open Universities; Social Change

ABSTRACT

Management principles and trends are examined with attention to open higher education. Administrative activity includes policy-making, technical tasks, and institutional direction. Open higher education includes programs to prepare both professional and semi-skilled workers, as well as programs that meet personal and social aims. Participation in open education can be continuous or recurrent through a life span. Forms of inquiry into higher education include program evaluation, action research, policy studies, research and development, conceptual studies, and classical designs. Values of concern to academic managers concern quality, equality, and efficiency. Directions being followed by managers focus on planning, the external environment, the people involved, the future, technology, and open communication processes. Also considered are potential problems encountered in planning, internal management challenges, and projected changes for lifelong learning. Appendices include: information on U.S. organizations that assist with academic management; a paper by T. M. Williams on a lifelong learning delivery system for Utah; a paper by Jerry Debenham on the CADA computer decision system; a list of delivery systems in open higher education; and a list of management elements for open higher education that were found in the literature. (SW)

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OPEN HIGHER EDUCATION: THE MANAGEMENT CHALLENGE

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The management challenge of open higher education is an imposing topic. The management of an educational program is a highly pragmatic venture involving practical judgments and actions that balance the desirable with the possible. As a University President recently told me, "Administration of higher education is at base the art of the possible." Resources are always limited in terms of needs; establishment of realistic priorities often challenge entrenched interests; large, diverse populations to be served and the geographical dispersion of clients in those populations confront management with a variety of practical problems; the rapid growth of knowledge, but more importantly the changing nature of knowledge and new uses of knowledge produce rapid obsolescence in programs and necessitates entirely new ones; the new technologies and delivery systems pose choices which contain both short and long term hazards because of the commitment, costs and organizational changes they required. This beginning list alone represents management challenges which might each serve as a topic of analysis.

Contemplation of this list does give some insight into an initial set of observations about the nature of the management of open higher education. First, management activities are both diverse and complex. Identification of needs and establishing priorities, for example, require technical skills (needs assessment, evaluation of program capacity and capability, market potential, mission and purpose identification); deliberation and negotiation skills, both internal and external to organization; skills in, and knowledge of, decision-making processes; and implications for policy, to name but a few. Second, as

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already noted, the activities of management are rooted in the realities of on-going institutions and programs. As Christopher Hodgkinson (1978,23) notes, "The form of administration is action-focused and the stereotypical attitude of administration is pragmatic." Third, the arena in which management functions are conducted is highly situation specific. The terms used to address the programs under consideration here is but one symptom of the apparent need to indicate uniqueness: open access, continuing education, recurrent education, university without walls, external degree, adult education, distance learning, lifelong learning being only a few. The reference to the pragmatic nature of administration is another symptom of situational specificity since local conditions are major constraints to programs. Fourth, the management of education cannot be viewed as static sets of concepts, procedures and practices; client and societal needs, the knowledge base, the technologies, and management itself are all in change. Implications of each of these assumptions is taken up as the challenges selected for presentation are addressed. Before that is attempted, however, I shall turn to two other considerations.

Management Specified

For the purposes of this paper, a delimitation of the topic is in order as well as a specification of the terms management and administration. Management here refers to the functions, procedures and means oriented activities of an agency or organization while administration refers to the execution of management functions by managers. Administration might be thought of as the art, strategies and values as opposed to quantitative-factual, structured and scientific ends-oriented activities. This definition conforms to the nomenclature of the Royal

Institute of Public Administration and the usage of American authorities. The distinction between these terms is not precise and is often blurred or not followed in the literature.

Administrative activity is generally conceived to consist of three broad categories of management functions: policy making, institutional direction and technical-tasks attended by three levels of managers as depicted here:

Functions	Representative Activities	Administrators
Policy Making	Long range planning; external relations in policy making; strategy determination; public deliberation; resource acquisition.	Top level managers
Institutional Direction	Operational policy; short range planning; program determination organizational leadership; internal resource allocation.	Middle level managers
Technical Tasks	Program implementation; staffing and staff development; budget; student services.	Lower level managers

From: McCleary, L.E. in Orlosky et al., 1984 Educational Administration Today. Columbus, Ohio: Merrill, Ch. 2. Also the administrative levels are those used in UNESCO training, see Exchanging Experiences in Educational Planning and Management, 1981. UNESCO Regional Office for Education in Asia and the Pacific, Bangkok, Thailand.

Although the categories of functions are reasonably discrete, the staffing of those functions cannot be. Top level managers must concern themselves with internal direction of institutions and, in fact, are often the same individuals; lower level managers (heads of individual programs and technical-managerial specialists) need to participate in institutional direction activities and in policy making.

Open High Education Specified

In order to provide an operational definition that permits a reasonable delineation of the topic for purposes of analysis and discussion, open higher education might be defined in terms at least four conditions. For this purpose, open higher education refers to:

1. Education provided beyond completion of compulsory schooling, usually beginning during the age range of 15-18 years.
2. Participation in education can be continuous or recurrent throughout a life span with freedom to engage in or withdraw at the learner's choice.
3. Programs should be sufficiently broad to include vocational (professional to semi-skilled), general, personal and social aims.
4. Programs should be planned and provided by an educational entity such that authority and responsibility can be assigned and continuity guaranteed over time.

Adapted from: The Education of Adults: A World Perspective, 1975. UNESCO, 2nd Edition, pp. 21-24.

The Challenge of Identify and Domain Definition for Management/Administration

A beginning was made in the opening of this paper to distinguish between management and administration; also, it has been noted that a distinction exists within organization from highest to lowest levels. Hodgkinson, already cited, offers one conceptual set of dimensions which he perceives as continua. They are provided here (Hodgkinson, p. 4).

CONCEPTUAL CONTINUA FOR MANAGEMENT-ADMINISTRATION

	Science	———————	Art
	Executive	———————	Policy
	Facts	———————	Values
MANAGEMENT	Lower	———————	Upper ADMINISTRATION
	Echelons	———————	Echelons
	Tactic	———————	Strategy
	Quantitative	———————	Qualitative
	Material	———————	Human
	Active	———————	Reflective
	Specialism	———————	Generalism

This set of dimensions does not exhaust the list. Also, the terms are often reversed in usage. In this usage, however, the pure administrator would be a philosopher and the pure manager would be a technologist.

The definition of the domain of the field has employed three schema: function, process and fundamental theories. The following list is representative of the concepts employed in domain definition.

PROCESS	FUNCTIONS	THEORIES
Planning	Program-operations	Organization theory
Organizing	Supervision	Decision theory
Motivating	Staff personnel	Leadership theory
Communicating	Student personnel	Communication theory
Controlling	Leadership	Systems theory
Evaluating	Finance	Value theory
	External Relations	

Each of these schema have been used 1) to guide inquiry into problems in the field of management, 2) to provide a definition of this field of activity in order to address leadership, decision-making, role specification, etc. and 3) to structure preparation and training to achieve more effective performance in management roles. Mackenzie (1969, p. 81) constructed a diagram in which he placed management concepts in some logical order. The Diagram is given in Appendix A.

Fundamental to the challenge to identity and domain definition is the situation specific nature of management already noted. This recognition of situational specificity represents a major challenge in any attempt to build a knowledge base for practice. In the international scene situational specificity frequently has been demonstrated when programs and practices successful in developed countries have been transplanted, more or less in en toto, to third world countries and have been ineffective. Other evidence of the recognition of the challenge of situational specificity can be seen in the types and uses of research now undertaken in this field. It appears to be largely made up of case studies, individual program evaluations and descriptive accounts of projects. One immediate project that might yield significant results for open higher education would be a meta analysis, or secondary evaluation, of this large body of information. One aspect of such an investigation would be to determine the situational elements common to programs and projects in relation to measures of their effectiveness.

The Nature of Inquiry as a Challenge

In addition to situational specificity the adjectival typing of management-administrative into subsets of educational, public and business has, to a significant extent, restricted the flow of useful information both for practice and for knowledge accumulation. Studies which involve higher education should seek to include lower education and the other arenas of management as components. There is a sharing of research across these arenas but not the inclusion of them. There is perhaps more commonality between high tech industry, research and development organizations, banking and communications enterprises in terms of certain variables than is likely between the wide variety of

educational organizations. This is true of such variables as: organizational structure, authority allocation, change processes, and the like. Banking, for example, characterized as conservative and slow to change, has been one of the leaders in the adoption of technology. Large corporations have moved rapidly into long range planning and into their own manager inservice educational programs. Research and development organizations have been highly successful in allocating authority in nontraditional ways in order to accomplish creative development work.

Kinds of inquiry should be examined as well. The typology proposed here consists of six identifiable forms of inquiry and characteristics from which distinctions between them can be made.

It should be clear that all forms of inquiry are necessary for healthy development. An analysis of the current state of inquiry relative to open higher education management is beyond the scope of this paper; although a search of this literature was carried out. A first assumption from that literature search is that inquiry is heavily loaded toward program evaluation, action research and policy studies. These forms are essential to decision making and decision making is the essence of management. However, the question of long term vitality for higher education, and particularly for open higher education, would imply a careful assessment of the forms of inquiry. DeLandshere (1982) prepared a monograph for UNESCO, Empirical Research in Education. However, he makes no direct reference to empirical research in the management of education. This fact alone should give us some cause for concern. His treatment of issues of qualitative versus quantitative research has particular relevance for higher education, but the substance of higher education is not treated.

FORMS OF INQUIRY IN HIGHER EDUCATION

Characteristics	Classical Designs	Conceptual Studies	R/D	Evaluation	Action Research (Project)	Policy Studies
Primary Purpose	Knowledge Confirmation	Concept Clarification	Product Development	Quality Control	Specific Problem	Goal Setting
Control: Contamination Proof Internal Validity	High		Moderate			Low
Generalizable: Context Proof External Validity	High		Moderate			Situation Specific
Ojectivity Bias Proof	High		Moderate			Low
Replicatable Reliable	High		Moderate			Low
Values Interpretation	Value Free					Judgemental

The challenge associated with forms of inquiry does not exhaust this topic. Within the forms of inquiry there is much room for improvement. Program and institutional evaluation often is cited as being restricted to program or institutional activities ignoring basic assumptions upon which the activities are based, for example, whether other models or service units might be more effective or whether other needs might be more pressing (Feesley, 1983; Griffith & McChusky, 1980; among others). Knox (1982, p. 74) notes that,

> Effective practices for setting objectives, or organizing activities or programme evaluation occur in one segment (the institution) but not in others.

This observation, which Knox reports as a finding, indicates the variation in practice relating to forms of inquiry.

Keegan and Rumble (1982) indicate a number of evaluation criteria used to determine the success of an open learning program. They list:

1) access - how many and what kinds of people are served,
2) relevance - program offering compared to community needs and expectations,
3) quality - student outcomes
4) cost effectiveness - impossible without a "competing program;" alternative.
5) institutional impact - influence upon goals, policies and practices of other the community.
6) production - number of students, time to produce a graduate and number of graduates in proportion to students admitted.

Although these authors do not extend their analysis, it should be apparent that these measures could be related to a variety of management requirements, for example, to need assessment and to program planning.

Challenge of Basic Values

Three underlying values constantly arise in the management of open higher education. They are quality, equality and efficiency. Quality considerations in higher education have their roots in elitism. Quality has meant absolute standards based upon scholarly expectations defined by the best minds of a given field and to restricted definitions of what constitutes higher education. Quality considerations have led to admissions requirements, rigorous external examinations, grading systems and other academic control mechanisms. Equality considerations have their roots in the democratization of higher education and efforts to open learning opportunities to the entire population. Efficiency is inherent in management as managers attempt to achieve goals with the least cost and effort. The challenge arises in that increases in emphasis on quality, traditionally conceived, reduces equality and the reverse. Efficiency on the other hand is meaningless without a clear definition both quality and equality. The institution committed to equality considerations will have different criteria for and measures of efficiency of its operation.

Those who are committed to equality have the more difficult task. In open higher education systems relative standards must be used to measure gains (e.g., the measure of performance of learners upon entry against either the gain each learner demonstrates or the gain achieved by a group of learners in terms of comparable groups using different learning systems). One can develop a management grid to identify efficiency criteria somewhat in the manner shown. Careful noting of current practice vs desired practice for each cell permits an examination of the relationships among the three values. Practices can be specified such that criteria of efficiency can be determined and

	Quality	Equality	Efficiency
Organization Structures	Current / Desired Practice		
Resource Allocation			
Personnel Required			
Program Definition			
Delivery System			
Materials, Facilities			
Student Achievement			

measures taken. This form of evaluation strategy is useful in assessing programs and also in projecting needs. However, some rational, overt means are needed to expose and examine these three interrelated values.

The Challenge of the Future: External Forces

In a recent international conference concerning the future of higher education there was general agreement among university, business and political leaders about the immediate directions that management is taking with all types of organizations but especially higher education. This is their list:

1. Planning is becoming essential - called "outside-in" planning it is not highly quantitative; it is tuned to external conditions and internal strengths and conditions, more an analysis than a blue print.
2. External environment and the potentials of the area served is receiving detailed attention - demographics of population age and distribution, economic data about the region, plans of industry and government, educational needs of the total population, etc.
3. Future is becoming more important than the present - management is concerned with public support and the quality of programs that will influence long term stability.
4. Technology is becoming an essential tool of management - managers are computer literate: planning, control, evaluation and reallocation are becoming the primary management functions.
5. People are becoming more important - more attention is paid to faculty and staff, quality and adaptability of people is the important element in vitality.
6. Communication processes are becoming more open - there is a trend toward a more open style of sharing information with a variety of groups.
7. Governance is taking new forms - more action groups are brought together to solve problems, initiate programs, participate in planning and evaluation.

8. Managers are taking a more active role - there is more centralized decision making, more direct intervention to end or cut programs and add others, and to alter direction.
9. Finance is becoming more important - decisions are being more driven by financial concerns.

The list has no particular validity except for its suggestiveness for our own situations as provided by a group of knowledgeable and practical individuals.

There are some well established external conditions that present challenges which are pervasive. First, there exists a widespread and growing understanding of lifelong education needs. "Those who have been deprived of an education are nothings," as a Minister of Education of a Latin country recently told me. In developed countries three to five changes in careers for a majority of people is a reality. This condition translates into an enormous demand for open higher education which extends over the life span of each individual. The 1980, U.S. census documents that 45,000,000 adults beyond twenty-one years of age are in some form of formal education. This pent up demand results in a serious shortage of resources for which there are no easy solutions.

Second, high technology is now a necessity both in the management of higher education and in the educational programs themselves. The mastery of use of this technology will occupy managers of higher education for the short run (perhaps a decade) until it is assimilated. Useful management tools are provided by the computer, see Appendix B, and for delivery systems such as micro-wave networks, see Appendix C.

Third, alterations in the "information age" will force changes upon higher education which hold particular relevance for open higher education. From a paper entitled, "Mass Producing Intelligence for a Rational World" (Debenham, 1980) five major areas of change are projected for life long learning:

1) Reorganization of general education around life decision systems rather than disciplines - teaching knowledge in subject areas based upon the basic discipline was desirable when tradition and intuition guided decision making; intellectual competency is now required for interdisciplinary decision analysis;
2) Emphasis will be upon changing relationships rather than upon static relationships - changing life conditions require differing modes of sharing, negotiating values, etc. within the family, the work place, and the community;
3) Focus upon aggregates of individual and social needs and away from historical and traditional institutional determination of what needs are to be served;
4) Reorientation of learning from memorization and categorized systems to information that is openly accessible which can be utilized to solve immediate problems and anticipate the future; and
5) Expansion of education into all sectors of the society and the deinstitutionalization of learning. (See Appendix D)

Open higher education has made significant beginnings in anticipation of the social forces that are bringing about the changes noted here. The challenge will be to find the means and the will to pursue them with vigor.

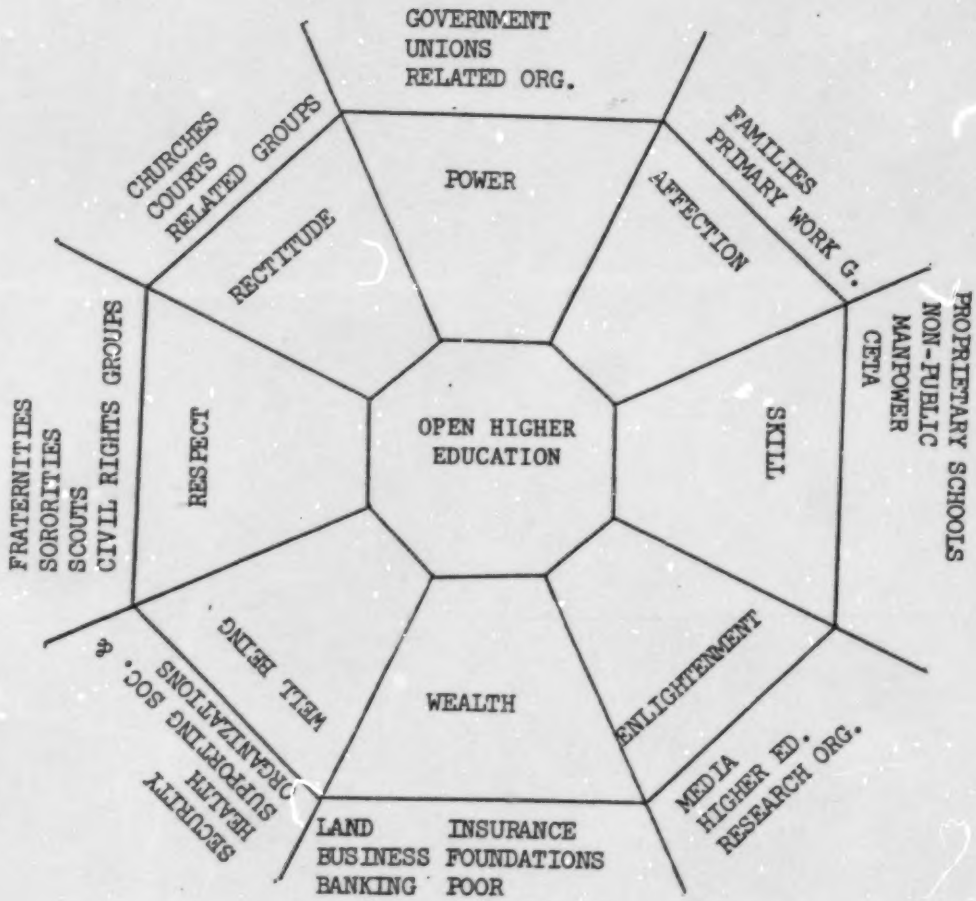
Fourth, open higher education will need to relate more closely to its communities whether local, district, national or international. How well this is done largely determines the effectiveness of programs from two directions: 1) identifying and meeting educational needs and 2) generating financial and moral support. At any level, a community can be analyzed in terms of sectors which form around basic values. In an adaptation from Lasswell and Kaplan (1950) eight basic values appear to be universal and upon which social institutions form. How each of the values is met depends upon the strength of the institutions supporting that value and how fully community members have access to the means, through their institutions, to actualize these values in their lives.

Open higher education is placed at the center in this conceptualization because one can assess the community served in order to arrive at judgments about the educational needs of a sector versus the support desired to accomplish goals. This conceptualization provides a blank "map" which can be filled by known planning devices such as surveys, advisory boards, etc.

The logical management concern flowing from external forces is planning. The management style of open higher education is what has already been referred to as "outside-in" planning. The methodologies and tools for this work are well developed. The UNESCO Regional Office for Education in Asia and the Pacific has an outstanding seven book program which details the planning process (UNESCO, 1982). It represents a major contribution. About planning, I shall only provide a topology of potential problems in planning by Bean and Kuh (1984) which might be of use in implementing a planning process.

SECTORS OF A COMMUNITY AND BASES OF INFLUENCE

RELATIVE TO OPEN HIGHER EDUCATION



Adopted from Lasswell and Kaplan, Power and Society

A TYPOLOGY OF THE SOURCES OF POTENTIAL PROBLEMS ENCOUNTERED IN PLANNING

Organizational Constructs	Assessment of the Capacity to Plan	Initiation of Planning Activities	Development of the Plan	Implementation of the Plan
Goals	Level of institutional concensus	Purposes of planning are unclear Goals may change during the process Goals differ at different organizational levels Hidden agendas	Unclear expectation for planner behavior Conflicts with vested interests	Goal displacement Limitations of rational processes "Rational means to irrational ends" Adaptability
Participation	Psychological preparedness of participants	Too many or too few people Representative levels Experts Use of new of existing structures	Inadequate representation Anarchistic behavior Technical staff/faculty relationships Authority not commensurate with responsibility for planning	Reward participation Understanding change Expecting conflict Incremental adaptation
Information and communication	Access, types available Current patterns of communication	Technical aspects of planning Accuracy and relevance of information Limitations of planning	Clear understanding of planning process Periodic status reports Balanced treatment of unit data	Communicating the plan Appropriate level of specificity Feedback, evaluation and revision Degree of flexibility of the plan
Interdependence (internal, external)	Relationships between units	Appropriate scope of planning Degree of coupling among subunits Timing relative to external requirements Length of planning cycle	Involvement of units that must carry out plans Relationship to line administrators and faculty	Environmental changes Plan designed for external and not internal audiences
Resources	Time (staff) Expertise Organizational slack	Adequacy for planning process	Commensurate with unit needs Adequacy for implementation	Realistic process expectations Conflict and turf protection Continuation costs

From: "A Typology of Planning Problems, Journal of Higher Education," 55:1 (Jan-Feb) 1984, p. 43.

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Internal Management: The Challenge of Decision-making

The external challenges to management seem largely to represent a different genere than does the internal management challenges. Most problems external to the programs and institutional arrangements are more of the order of dilemmas--conditions which are studied, negotiated over, and somehow come to terms with. They are not amenable to the linear, rational, problem-solving, decision-making models which are taught in graduate programs for managers. Internal problems, with few excepts, have an information base and logical organization procedure for solution. They are solvable in a problem solving sense.

The challenges which surround internal problems relate rather to characteristics such as: 1) basic organizational structure and decision-making procedures, 2) authority of managers in relation to specialists, 3) internal support for programs and activities, 4) controls over resource allocation, and 5) change strategies. In this regard there is some evidence (Fecskey, 1983, Keller, 1983, among others) that higher education management generally is becoming more in tune with management patterns of open higher education. These observations include: 1) that more authority and active intervention in programs and staffing is being exercised by managers, 2) that long range planning in an "outside-in" approach is being employed versus letting each faculty determine its own direction, 3) that innovation is being actively supported with resources, and 4) that student and "market" needs are being attended to at least as well as are the traditional offerings and fields of study. Academic leaders are recognizing that educational programs need organization and management systems that are based upon a body of knowledge and tools for "a rational assessment

and systematic selection of goals and purposes; the development of strategies to achieve goals; marshalling of resources; organization, direction, and control to attain goals; and the motivation and rewarding of the people to do the work (paraphrased from remarks by Professor Theodore Levitt, Harvard University, 1984).

The internal challenges will remain: resource allocation between formal, on-site programs versus distance, off-site programs; the need driven versus traditional offering driven programs; adequate staffing and reward for meritorious effort; and the need to innovate in order to extend education for everyone.

The challenges to open higher education begin with 1) clarification of the management function and with domain definition of this field, particularly in its relevance to the totality of administration beyond higher education. There is a challenge in terms of 2) the nature of inquiry in this arena of activity extension of it beyond the forms of inquiry that are primarily descriptive. This is important to the building of a knowledge base that extends practice into the future. The challenge of 3) basic values has only been touched briefly and should be extended beyond management per se into the search for purpose definition and the mission of open higher education.

External forces represent a pervasive challenge for it is the external forces which are driving change in higher education and creating: 4) the enormous need for life long, open education. Other

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Note: See Appendix E for a listing of open higher education services and delivery systems and Appendix F for a listing of key elements of management from the literature.

external challenges are: 5) high technology, 6) the information age with its social and economic impacts, 7) and the relationship of open higher education to local, national and international communities. Finally, there are the challenges arising from internal forces which include primarily those of 8) decision-making, 9) authority questions and 10) resource allocation.

These ten challenges are not new or surprising to us. The changing nature of the challenges which each presents requires that we examine them carefully and work on them cooperatively. Much has been accomplished to lay a foundation for the next era which is upon us. A noted philosopher from my country has said that, "civilization is in a race between education and disaster." Open higher education is a key element in that race and history will surely hold us accountable for how the race is run.

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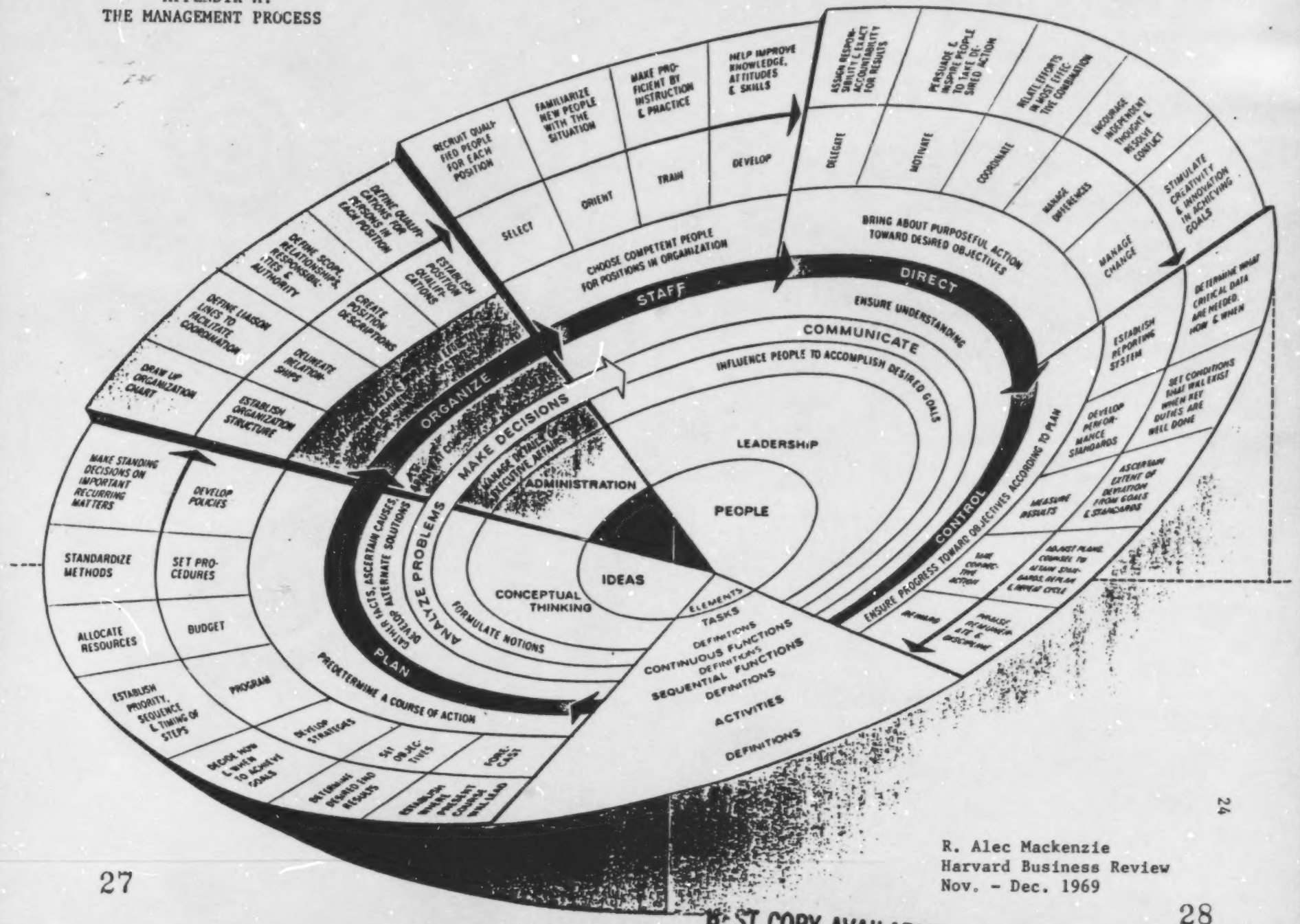
APPENDIX A:
THE MANAGEMENT PROCESS



R. Alec Mackenzie
Harvard Business Review
Nov. - Dec. 1969

BEST COPY AVAILABLE

APPENDIX B:
COMPUTER MODELS FOR HIGHER EDUCATION MANAGEMENT (EDUCOM): NEW DEMAND FOR MANAGEMENT SKILLS IN THE ACADEMIC WORLD

With the introduction of computers in higher education a group of U.S. universities formed a consortium to share information about the uses of new technology for research, instruction and management. Called EDUCOM, the consortium is headquartered in Princeton University and has 360 fee paying members in all parts of the world.

The EDUCOM consortium, in 1978, put into operation the EDUCOM Financial Planning model (EFPM). Today it is the most widely used computer driven planning model in higher education. Used by colleegs, extension divisions, hospitals and seminaries to plan any phase of operation--learning center, instructional programs, financial aid plans, etc.

Other organizations also exist in the U.S. to assist with management in the academic world. The American Council on Education, for instance, through its Center for Leadership Development and Academic Administration, headed by Joan McCall, runs a series of two-day colloquid for presidents, academic vice-president, and deans on subjects like academic quality assessment and control, financial planning, legal issues, and personnel selection and development and has a new department chairman training program for the estimated 50,000 academic department leaders in the nation. ACE's neighbor in the "educational Vatican" at One Dupont Circle in Washington, D.C., the American Association of State Colleges and Universities, now has a Resource Center for Planned Change which stresses better recognition of social, economic, legal, and technological trends and internal planning to respond to, get a jump on, or defend against these changes. And a Boulder, Colorado, organization, The National Center for Higher Education Management Systems, or NCHEMS, has been moving away from highly quantitative, and analytical management science activities into more decision-oriented workshops, planning, and consulting.

Thus, some of America's academic leadership is sculpting a new management style by trial and error on the job and by going to seminars and classes as they did when they were students to learn how complex organizations work, how computers can assist them, and what contemporary management and planning are all about.

APPENDIX C
A COMPREHENSIVE, MULTI-INSTITUTIONAL-LIFELONG LEARNING DELIVERY SYSTEM FOR THE STATE OF UTAH

Dr. T. M. Williams, Administrator
Community Service and
Continuing Education Programs

What is Proposed

This brief paper sets forth some of the features of an ambitious but feasible approach to equalizing educational opportunity in Utah.

The approach is the development of an integrated, statewide system for delivery of state's individual'-development and community-betterment cooperative, multi-institutional and multi-agency approach which promises greatly improved access to the state's educational, and cultural and other human betterment resources for those who are presently disadvantaged by geographic, economic and related barriers. It purports to be able to achieve this--to a far greater extent than heretofore--on a convenient community or neighborhood basis in a variety of scheduling and utilization patterns.

This cooperative, all encompassing approach to planning and delivery of human betterment services represents an enlargement upon emerging new concepts of college and university continuing education and the "community school" idea pioneered in Flint, Michigan, through support of the Mott Foundation. It proposes to amalgamate the efforts of a wide variety of federal, state and local agencies and institutions into a coordinated, truly comprehensive, statewide education-cultural outreach and human betterment effort.

The effort is voluntarily undertaken by a varied group of service providers, equal in status, and jointly concerned about underserved citizens throughout the state.

The approach carefully articulates role definitions, a sharing or pooling of resources and service capabilities, multi-agency consultation procedures, joint planning, and other forms of voluntary, mutually beneficial collaboration among the partner agencies.

Through this kind of cooperation the participating institutions and agencies are able to multiply their capacities for service far beyond what they are now able to achieve "going-it-alone." From this kind of collaboration and "synergism" effects makes prospects of a cradle-to-grave offering of educational, cultural, training and community betterment services to people of the entire state more than just a frustrated dream.

How This Delivery Capability Might Be Achieved

The "backbone" resource for achieving this augmented service capability is the state's existing college, public school and other community facilities--such facilities being utilized on an expanded more

diversified schedule as multi-purpose educational training, cultural and recreational centers. Many of these facilities are not fully utilized, particularly in late afternoons, evenings and weekends. Many are now used for delivering a limited range of services, frequently those of a single agency or institution. These facilities are being transformed (more fully than they now are) into a statewide network of regional, community and neighborhood delivery points for a broad range of educational programs and related services from a variety of institutions and agencies. Some new construction is required to fully implement some of the ideas which follow.

These centers are being interconnected by a appropriate multi-agency ground-air transportation system and a multiple-option telecommunication system capable of delivering a wide variety of programs, materials and services to both center buildings and nearby homes.

The approach envisions full use of local facilities and program resources. Through the kind of system for delivery of resources described, it is possible for every community in Utah to request and have delivered to it a rich offering of courses, programs and services from outside sources. With the right kind of patron and participant input these offering could be fine-tuned to the needs, interests and concerns of people of all ages and circumstances.

Comprehensive Community Centers

In this expanded role for local school, public library, college or other facilities, selected buildings, located within relatively easy reach of all citizens in a given community, are designated as comprehensive community centers or multiple-service-delivery complexes. Such centers serve as:

1. A comprehensive information and referral center through which residents of the community can become informed--and learn how to gain access to--the full range of community betterment and personal development services available in the State of Utah. At this convenient location they can learn about: (a) the broad range of public school, proprietary school, public vocational school and college/university offerings in their own and neighboring communities; (b) cultural, entertainment, sports and recreational events; and (c) a broad range of new or previously unavailable (or available only through travel to prohibitively-distant locations) programs and services which could be brought to the community by the people collaborating in the multi-agency program.

2. A base of operations and point of delivery for existing and presently unavailable services desired by the residents of the community in accordance with their unique needs and interests. Each center provides: (a) class, meeting, discussion and counselor or tutorial conference rooms; (b) library services (c) instructional materials distribution; (d) audiovisual equipment and materials; (e) television and movie viewing rooms, media and computer study carrels and teleconferencing facilities; (f) food service facilities (g) athletic

facilities and equipment; (h) hobby and craft areas; (i) child care facilities; (j) vocational and homemaking laboratories; (k) course and program promotion and registration services; (l) ticket sales for cultural and sporting events; (m) distribution of educational catalogs, class schedules and other descriptive materials; (n) counseling-guidance services and materials; and (o) other needed support services. This wide range of materials and services, as a result of joint use of personnel and a pooling of resources in an integrated, multiple-use facility is available by delivering agencies and patrons at a relatively low cost.

3. A point of contact through which residents participate in deciding what programs and services they would like to have available in the community. It would also be a facility at which residents might meet with fellow citizens, local program planners and institutional/agency administrators in conceiving, promoting and implementing desired programs. The center would be a place where people could work together to: (a) identify and prioritize (with help of trained specialists and needs supporting services) community needs and problems; (b) prepare program and service requests; (c) identify and procure resources; (d) identify or conceive programs to be exchanged or shared with other communities; (e) organize in teams or groups to promote and help implement offerings; and (f) engage in a wide range of additional activities which would help assure that needed and desired programs are made available and are utilized. This kind of involvement results in some breakthrough progress in maximizing the use of local resources in bettering the quality of life in the community of helping people of all ages achieve their personal aspirations.

4. A neighborhood location through which the local citizenry may gain access to (or arrange for delivery of) programs, technical services, facilitating resources and other services not normally available in their community. Here, residents seek help from their regional (or sub-regional) educational service center in arranging for (a) teachers, speakers or consultants from colleges, universities or the community-at-large; (b) specialists from state and regional agencies to assist them with various enterprises; (c) contract for performance of musical, dramatic, dance or entertainment programs of colleges, state or regional community arts associations, etc.; (d) make arrangement for touring exhibits, "packaged" training programs and the like; (e) arrange appointments with circuit-riding assessment-counseling-guidance people; (f) gain access to distance library and reference collections; plus (g) arrange for many other programs and resources from outside the immediate community to augment locally-available programs.

Comprehensive Regional Support Centers

As indicated, the prime support mechanism for the neighborhood center is a system of regional (and subregional, in some cases) educational service centers. Such centers are established in such locations as the geography population dispersal and other factors in the region suggest. They are multi-instructional and multi-agency centers having as tenants user/representatives from appropriate human-uplift oriented organizations active in the region.

At these centers is headquartered a wide and deeper array of program developers and coordinators, resource people, counseling-guidance specialists, learning materials collections, instructional media and telecommunication facilities, etc., than can be assigned continuously and permanently to each neighborhood center.

Housed in the regional support centers are those resources which--because of scarcity, sporadic demand, limited transportability, inadequate funding and other constraints--would best be made available to local communities and patrons on a regionwide basis. Regional centers also serve as a community-level point of delivery for programs and services to those residing near the facility.

To gain access to some services, community-level planners and patrons travel to their nearest regional center. Some services and programs based at the regional centers are transported on an "as arranged" or normalized "circuit-riding" basis to the community or neighborhood centers. Some of these could be brought in on an exchange basis from other regions of the state. Each regional center also is linked to a central, State of Utah "service center and program resource pool" by the statewide ground-air and telecommunications delivery system previously referred to.

All the regional support functions are housed in a single building in the "hub" city to which the regional support function is assigned.

How the Programs and Support Systems were Developed and Administered

Both community-level and regional centers--and the service delivery mechanisms which interconnect them into an interactive, needs-serving system--are largely autonomous entities operated and managed by public officials with inputs from the citizenry much as are the public schools and higher education institutions. Existing public school boards, institutional councils of the colleges, universities and continuing education centers in the region, community school councils, regional councils of government of patron advisory groups assume responsibility for developing the regional support and resource capabilities needed for the program they believe is feasible in the region. They are supported in their efforts by interested funding and service agencies of local, state and federal government and/or private sector foundations and public service organizations.

Regional, as well as community-level, groups and individuals also work together in generating the kinds of programs and services they would like to see delivered to them through the multi-organizational system.

Ideally, every citizen in a given region could be given an opportunity to input into the program development proceedings. It might be possible and desirable for the varied partners in the enterprise to develop a cooperative needs/interests assessment and sentiment-sampling mechanism to assist in planning the initial programs and service offerings for delivery via the expanded capability. Hopefully, a permanent cross-agency needs assessment and program evaluation mechanism will evolve to enable agency programmers to offer, on an ongoing,

cost-effective basis, the specific programs people want and need. Hopefully, offerings generated in this manner would be economically feasible due to the collaborative relationships, facilities sharing, resource pooling arrangements and the more efficient delivery mechanisms developed through coordinated local, regional and statewide planning as suggested in this paper.

Administering and Conducting the Program

As was indicated, the community centers in a given region are connected to--and receive a wide variety of supporting resources and services from--a nearby regional (or sub-regional) service center. Where regional centers are located on a college campus, the continuing education dean or director (or his designee) doubles as center administrator and as administrator of the continuing education/community service offerings of his or her institution. He or she also acts as an agent for other colleges and universities offering programs and services in the region.

Where the center is located in a building owned by a public school district, the center administrator is the district community school coordinator doubling as the building administrator and regional community school coordinator. The center administrator serves as the community school coordinator and counselor for the public school district in which the building is located.

Higher education program coordinators and counselors serve the entire region from the regional service center. All offering institutions legitimately active in the region are shared-users of the delivery system radiating out from the regional center into college buildings, public schools, libraries, homes, and other community-level delivery points. Program coordinator-counselors and other out-stationed personnel from state agencies having training-related programs for delivery through the system can also be tenants.

All agencies and institutional tenants electing to house "out-stationed" planners and programmers in the regional centers retain full operational autonomy in the conduct of their programs. Their relationship with the center administrator is similar to that which buisinesses and professional people have with the facilities manager when they contract for space and "set up shop" in a commercial shopping mall. Except for the usual housekeeping rules and other traditional landlord prerogatives, tenant agencies operating out of the regional service centers are responsible to the center administration and other tenants in no way in carrying out their legally-santioned and traditional services functions. However, it is assumed that having outstationed people from a variety of agencies "doing their own thing" under the same roof would encourage and facilitate mutually beneficial, but voluntary, cooperation and resource sharing. It also facilitates appropriate multiple-agency program planning and other forms of collaboration in meeting the service expectations of a wide variety of patrons.

Implementation

The program was phased to provide an initial period during which public officials, educators, business and professional people, potential patrons and other concerned parties were fully "briefed" and given assistance in assessing the relative merits and demerits of collaborative, multi-agency delivery approach.

The exploration proceeded from the outset with the full concurrence and active leadership of the top administrators of educational and other interested human-needs-meeting agencies of local and state government. In the key education and government agencies assuming the leadership initiative.

The emphasis in this exploration was on the delivery of the education and training aspects of the state's personal development and community betterment enterprise. However, all agencies having human needs--meeting outreach programs which might be enhanced by delivery mechanism which as envisioned here were invited to join in the exploration. Participation was on a voluntary basis with firm assurance that no institution or agency would be placed in a subordinate position relative to others.

APPENDIX D
THE NEW KNOWLEDGE INDUSTRY
taken from a paper
MASS PRODUCING INTELLIGENCE
by
Jerry Debenham
The University of Utah

Computerized analytical decision making has been significantly promoted in recent years by advances in operations research, statistical decision theory, and systems analysis. Econometrics is a branch of the business world which is extensively catering to this need for sophisticated computer decision assistance. The Club of Rome studies are among the best examples of this type of development in social areas. The social planning models of MIT, Harvard, and Columbia, however, have not found general application in any decision environment.

Why has computer automated rational decision analysis not been widely applied outside of the business world? Until recently, there have been no computer autonomated all-purpose analytical decision models. Sophisticated matrix languages such as APL had to come into their own and programming techniques which allow the computer to "reprogram" itself had to be created. Prior to these developments, almost all computer decisions models were designed with specific applications and were soon outdated. Second, devlopment of specific or special purpose computer models has been very expensive, often costing hundreds of thousands of dollars. Third, models were inflexible. Since decision environments tend to change rapidly, it must be possible to change the content of models almost instantaneously. Finally, computers have been relatively inaccessible and expensive. Only recently have time-sharing systems, inexpensive mini-computers, and portable terminals overcome these obstacles.

The CADA system is designed to overcome each of these limitations of computers, as well as objections to rational decision analysis in general. Better, more consistently rational decision making must occur if we are to survive this next century of crisis. We believe that CADA is a significant step in that direction.

THEORETICAL FOUNDATION

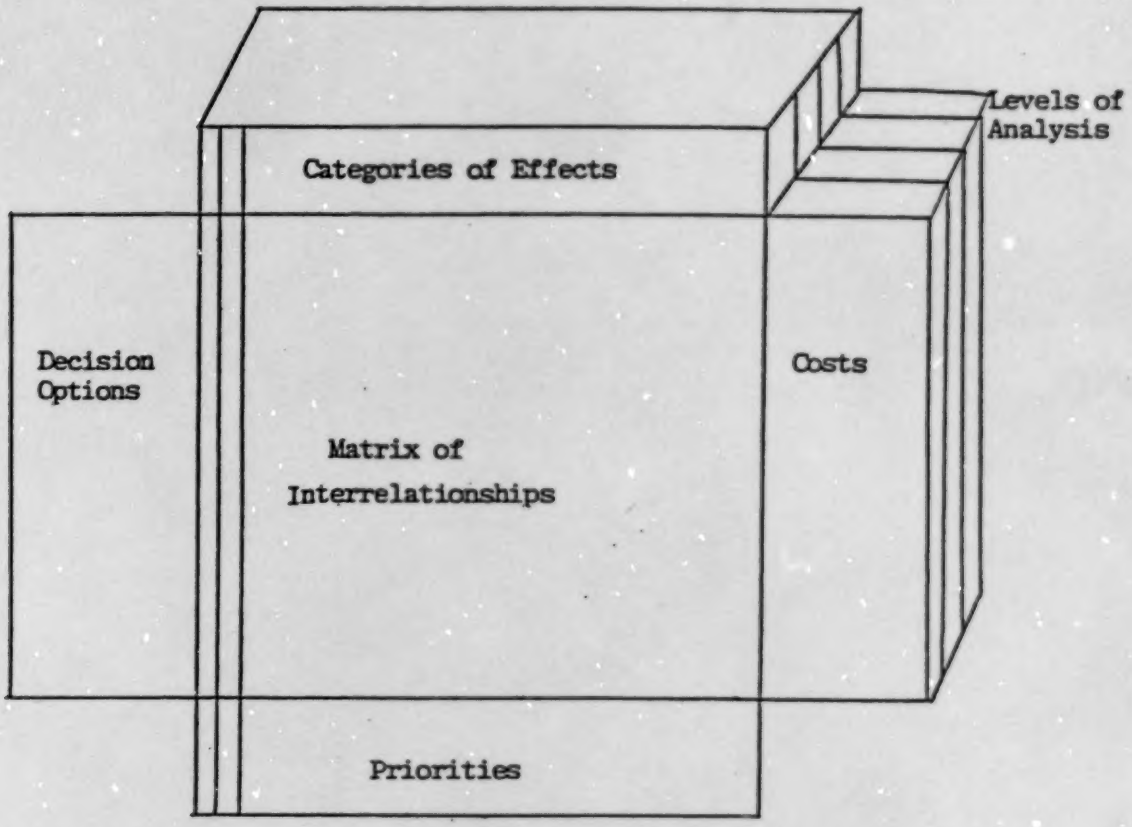
The computer decision systems we are proposing are simple to use and yet have innumerable potential applications. The basic model[4] consists of the following four elements as the basis for rational decision analysis: 1) decision options; 2) categories of effects; 3) priorities;
and 4) costs. These are related by the following basic formula:

$$\text{Desired Option} = \frac{\text{Anticipated Effects X Priorities}}{\text{Anticipated Costs}}$$

[4]The "rational-deductive" ideal to which we refer has been debated by social scientists and philosophers over the last several centuries. Our

Complex variations of the formula are applied depending upon the number of options and categories of effects considered, anticipated variations in these effects over time, as well as changing priority and cost levels. The figure below shows how these elements can be used in a decision matrix for systematically analyzing almost any type of social or personnal problems.

General CADA Model of Decision Analysis



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use of the word "rational" refers to a general consensus of philosophical opinion summarized by Braybrooke and Lindblom as follows:

". . .determination of policy becomes simply a matter of calculation, a question of feeding in the observed facts and thinking consistently through a sequence of logical transformation. One discovers the facts, looks up (or derives) the relevant hypotheticals, and deduces by strict logic which policy is to be selected. Nowadays, the work does not even seem impossible tedious; one imagines that a suitably programed computer could do it."

David Braybrooke and Charles Lindblom, op. cit., p. 10.

The CADA approach to rational decision making requires the user to perform the following operations:

1. Exploration of a full range (1-x) of meaningful or possible variations or decision option (DO_{1-x}) before acceptance or rejection;

2. Identification of all the categories of effects (CE_{1-x}) which are relevant (i.e., political, economic, quality of life, social, and education effects);

3. Quantification (Q) of the impact of any or all of the alternative decision options upon each or all of the categories of effects and organized into a first dimensional matrix (MAT):[5]

$$MAT \leftarrow ((DO_x), CE_x) \epsilon Q$$

4 Projection of the costs (C_{1-x}) of alternative decision options under alternative implementation plans;

5. Study of alternative priorities (P_{1-x}) for analyzing the various categories of effects upon different value orientations (i.e., minorities, business, religious leaders, etc.).

Actual decision analysis in CADA varies from one application of the model to another along the following progression of complexity;

A) Comparative Desirability Models- The computer selects among all options in the matrix (MAT) using the basis formula for comparative desirability. This may be expressed as optimums:

$$\lesssim \quad \frac{MAT_{1-x} \times P_{1-x}}{C_{1-x}}$$

or as rank order:[6]

$$\downarrow \lesssim \quad \frac{MAT_{1-x} \times P_{1-x}}{C_{1-x}}$$

B) Selective Desirability Search Models- In these models, the computer searches for particupar groups of variables (CHOICE) in the matrix:

$$\downarrow \lesssim \quad \frac{MAT\ [;CHOICE] \times P\ [CHOICE]}{C}$$

and may give optimums or rank orders.

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[5] APL notation for creating such a matrix.

[6] $\downarrow$ is an APL symbol for rank order from highest to lowest.

c) Diagnostic Value Models-The computer now uses two or more matrices (MAT_{1-x}) to make comparisons before the basic formula is applied. For example, "actual" may be compared to "symptoms," or "self" compared bo both "ideal" and "real."

$$\forall \leq ((MAT_1 - MAT_2) \times P_{1-x})$$

These may also be indexed for traits and listed by rank order or options.

D) Multiple Order Simulation Models- It is often important to trace the effects of decisions through many orders of analyses (OR_{1-x}).

The CADA model can take the first two dimensional matrices of decision logic and extend them into a third through nth dimension of effects analysis.

$$OR_1 = \leq MAT[CHOICE_{1-x}; CHOICE_{1xy}]$$

MAT_x is a matrix of effects upon effects

$$OR_2 = \leq MAT_x\ (_{1-x}) \times OR_1$$

To the nth dimension

$$OR_N = \leq MAT_{x(1-x)} \times OR_N$$

For example, we may conclude in the level one analysis that OPEC oil price increases have significant effects in 120 dimensions of world economic analysis. These are first-order effects which may be calculated by intuition, delphis, or empirical studies and may be represented in the matrix by directional numbers or algorithms. It is important to determine how these first-order effects further affect other dimensions of analysis. If an energy strategy is adapted and decreases oil consumption according to certain empirical measures, how does this affect employment, for example, a second-order effect? How do these changes eventually affect world peace, a fourth-order effect?

E) Full Simulation Models- By combining a number of multi-order matrices, a simulation of a "complete" system may be created. Many of our simulation games for teaching and research are on this order.

F) Reasoning Simulation Models- By combining several system simulation models, it is possible to create a "responsive" simulation in which the computer uses the strategy of achieving objectives in one system by the responses it gives in another.[7]

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[7] An example of this is the simulation Negotiate developed at the University using the basic CADA approach. See 00916, "Simulating Teacher Negotiations," Proceedings of the 16th Annual Conference of the North American Simulation and Gaming Association, Nancy Roberts, Editor, 1973.

In sum, there are three distinct features of the CADA models which make them vastly more useful in rational decision making than other systems previously designed:

1. They are general logical models which can be applied to any specific subjects area depending upon degree of complexity desired by the user. Rather than designing specific algorithmic interrelationships between variables as in most business simulations, only the general logic structure is algebraically related in CADA.

2. The models are infinitely flexible in the sense that they can handle any number of variables or types of interrelationships. In a sense, they "expand" and "contract" according to the demands of the user. All variables are readily changed by simple English commands.[8]

3. Interrelationships are expressed in terms of a matrix rather than specific algebraic equations. Rather than tracing effects through hopeless quagmires of complexity, they are expressed in numerical directions and desirability is achieved by use of variations on the basix formula in spiraling orders of analysis.

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[8]Although the CADA model's change routines are currently in English, they can be readily translated into any language.

APPENDIX E
DELIVERY SYSTEMS IN OPEN HIGHER EDUCATION

I Scheduled Instruction
1. Skill Development: workshops, clinics, short courses, skills centers.
2. Formal Courses: where groups can be formed - off campus centers, factories and business, schools, clubs, churches, hospitals.
3. Individual/small group, self-study: Radio and TV (one or two-way),*
4. Computer based.

*TV can be broadcast; fixed service with a) closed circuit, b) cable feed, c) satellite; video disc or cassette.

II Action Programs
1. Applied research to solve a community farm or business problem.
2. Technical assistance, as with farm agents.
3. Demonstrations.
4. Special Projects, as with homemaker groups or clubs.
5. Community action groups.

III Individual Services
1. Counseling, testing.
2. Tutorial study.

IV Guided Experience
1. Personnel exchanges, visits.
2. Apprenticeships, internships.

V Information Services
1. Mass media: print, film, telephone, broadcast.
2. Information retrieval systems.
3. Telephone dial access.
4. Traveling libraries, book mobiles, classroom on wheels.
5. Exhibits, fairs.

APPENDIX F
MANAGEMENT ELEMENTS IDENTIFIED IN THE LITERATURE

Open higher education units are unique in management practices in several important ways:

1. Units are often planned and managed by partnerships of academic and nonacademic specialists than are campus based units. This is largely because collaboration is needed to produce materials for distance learning which is a complex and costly process.

2. Research relating to program development and the evaluation requires a variety of studies and information gathering which is valuable to management and to accrediting and controlling agencies.

3. There is the need to relate to a wide variety of "publics" and to communicate with them on a regular basis. The entire effort depends upon meeting client needs rather than relating to specialists in traditional fields of study.

4. Managers are more controlling and become directly involved in program and personnel decisions. Managers in the higher echelons of traditional institutions exercise little direct control.

Management elements for Open Higher Education treated in the literature as topics:

Fecsley, Charles Serving Learners at a Distance, 1983

Organizational Forms	Evaluation
Planning	Accreditation
Management and Governance	Student Assessment, Feed back
Other Institutions	Examinations
Finance	Research

Strother, Gerge and Klus, John P. Administration of Continuing Education, 1982.

Assessing Client Needs	Organization
Program Planning	Budgets and Finance
Delivery Systems	Faculty and Staff
Program Promotion	Student Services
Program Evaluation	Public Relations

Knox, Alan B. Developing, Administering, and Evaluating Adult Education, 1980.

Approach	Participation
Program Origins	Resources
Objectives and Activities	Staffing
Program Evaluation	Leadership

Willingham, Warren W. The Source Book for Higher Education, 1973.

I. Access Process
- Student Guidance
- Finance
- Admissions

II. The System
- Curriculum
- Evaluation
- Staffing
- Organization and Administration
- Structure

III. The Students
- Talents, Needs
- Educational Opportunities
- Groups

IIV Access, Agents
- Organization
- Programs

V. Information Sources
- Periodicals - journals, reports statistics, newsletters
- Special resources - data systems, information centers, general references.